PO-0976

HDR prostate brachytherapy: 3-D planned simultaneous integrated boost to the peripheral zone

R. Hepp[1], L. Herberholz[1], A. Petry[2], T. Eggert[3], L. Piotrowski[2], C. Morgenstern[1], G. Schabl[1], R. Galalae[1]
[1]*Evangelische Kliniken Gelsenkirchen, Klinik für Radioonkologie und Strahlentherapie, Gelsenkirchen, Germany*
[2]*Gemeinschaftspraxis Urologie Gelsenkirchen, Urologie, Gelsenkirchen, Germany*
[3]*Urologische Praxis, Urologie, Haltern am See, Germany*

Purpose or Objective: Radiotherapy (RT) is one of the most important curative options for treating localized prostate cancer (PC). At low α/β ratio of prostate tumors, HDR-brachytherapy (HDR-BT) represents a way to perform an absolute and radiobiologic dose escalation. When using 3-D real-time planning systems it is possible to optimize treatment plans generating dose distributions with an integrated boost (SIB) to peripheral zone (PZ) without substantially increasing the dose to the organs at risk (OAR), especially the urethra.
Aim: to analyze the dosimetric parameters (DP) and the acute toxicity of 30 consecutive patients (pts) treated with HDR-BT and a SIB to the PZ.

Material and Methods: From January 2014 to September 2015, 20 pts with intermediate/high risk PC were treated with combined external beam RT (EBRT 50 Gy/25 f) and HDR-BT (2 x 9 Gy in the 2nd and 4th week of the EBRT). In the same period, 10 pts with low risk PC were treated with HDR-BT monotherapy (3 x11.5 Gy, every 2nd week). In all implants a SIB of 20% (EBRT+HDR-BT) or 15% (HDR-BT monotherapy) to the PZ was planned. Equivalent dose at 2 Gy / fraction (EQD2), using α/β of 1.5 for target volumes and 3 for OAR, were calculated.

Results: Median age was 68 years (range 56-76). DP are presented in table 1. In 33/40 implants in pts with EBRT+HDR-BT dose-escalation to the PZ was reached (range 6 -44% of the prescribed dose). The median V100 for the prostate was 94.5% (CI ±1.6%). in 26/30 of the implants in pts with HDR-BT monotherapy the intended dose-escalation was reached (range 6 – 40% of the prescribed dose). The median V100 for the prostate was 92.8% (CI ±2.2%). No grade ≥3 toxicity was observed. Grade 2 toxicity was 13% and resolved within 1 month in 90% of the pts.

Table 1. Dose distribution parameters

Dose distribution parameters	Median	95 CI (±)
D90 Prostata (Gy)	9,8	0,2
D90 Boost (Gy)	12,0	0,3
Boost Factor (%)	123,9	3,6
D2cc Rectum (Gy)	6,6	0,4
D2cc Bladder (Gy)	5,4	0,4
D0.1cc Urethra (Gy)	11,5	0,4
EQD2 Prostata (Gy α/β 1.5)	112,1	2,1
EQD2 Boost (Gy α/β 1.5)	141,2	3,6
EQD2 Rectum 2 cc (Gy α/β 3)	75,1	2,1
EQD2 Bladder 2 cc (Gy α/β 3)	67,6	2,4
EQD2 Urethra 0.1 cc (Gy α/β 3)	117,2	3,1

Combined EBRT + HDR-BT (n: 20 pts, 40 implants)

Dose distribution parameters	Median	95 CI (±)
D90 Prostata (Gy)	11,8	0,4
D90 Boost (Gy)	14,0	0,3
Boost Factor (%)	119,1	3,6
D2cc Rectum (Gy)	7,6	0,6
D2cc Bladder (Gy)	6,5	0,6
D0.1cc Urethra (Gy)	14,9	0,4
EQD2 Prostata (Gy α/β 1.5)	135,6	6,4
EQD2 Boost (Gy α/β 1.5)	185,4	6,2
EQD2 Rectum 2 cc (Gy α/β 3)	51,3	4,9
EQD2 Bladder 2 cc (Gy α/β 3)	39,4	5,0
EQD2 Urethra 0.1 cc (Gy α/β 3)	154,9	6,0

HDR-BT monotherapy (n: 10 pts, 30 implants)

Conclusion: HDR-BT with SIB to the PZ is feasible in both combined and monotherapy settings. Acute toxicity was mild. Local control and late toxicity profile should be investigated prospectively.

PO-0977

Ten year patient reported Quality of Life following I-125 prostate brachytherapy monotherapy

A. Henry[1], B. Sethugavalar[1], T. Witteveen[1], B. Al-Qaisieh[1], P. Bownes[1], J. Smith[1], B. Carey[1], K. Franks[1], D. Mitchell[1], D. Bottomley[1]
[1]*St James Institute of Oncology, Clinical Oncology, Leeds, United Kingdom*

Purpose or Objective: This prospective longitudinal study quantifies patient reported Quality of Life (QoL) pre-treatment and up to ten years following permanent I-125 prostate brachytherapy delivered as monotherapy in a single institution

Material and Methods: 120 patients were asked to complete the Expanded Prostate Cancer Index Composite (EPIC) questionnaire, a comprehensive validated QoL tool designed to evaluate patient function and bother after prostate cancer treatment. Men completed the EPIC questionnaire before brachytherapy and at 8 time points after treatment (6 weeks; 6,10 and 18 months; 2,3,5, and 10 years). At each time point clinically relevant small, moderate and severe declines in QoL were defined as 0.2-0.5 times SD, 0.5-0.8 times SD and > 0.8 times SD of baseline function for each of urinary, bowel and sexual domains respectively.

Results: Response rates in the first two years were >90% but thereafter dropped to 75% at 5 years and 48% at 10 years. 50 patients (41.6%) responded at all stages. Maximal deterioration in mean urinary and sexual summary scores was noted 6 weeks after implant with severe urinary symptoms and moderate bowel/sexual symptoms at that point. At 6 months urinary and bowel QoL had improved to mild impairment which then fully resolved by 10 months. Sexual QoL remained mildly impaired throughout the 10 years. At 10 years new mild impairment of urinary and bowel QoL was also found.

Conclusion: Clinically mild changes in urinary, bowel and sexual QoL are found 10 years after I-125 monotherapy. The impairment in sexual function persists from treatment but urinary and bowel symptoms are new at 10 years and may be either a late effect of brachytherapy or due to increasing age.

PO-0978

Image-guided impact on the brachytherapy prostate treatment quality.

V. Cerboneschi[1], V. Ravaglia[2], M. Paoluzzi[3], M. Mignogna[4], M. Mignogna[1]
[1]*Ospedale San Luca, Radioterapia, Lucca, Italy*
[2]*Ospedale San Luca, Fisica Sanitaria, Lucca, Italy*
[3]*Ospedale San Luca, Urologia, Lucca, Italy*
[4]*Student, University, Pisa, Italy*

Purpose or Objective: Purpose: to evaluate the impact of the "image-guided" technology evolution on the implant quality in the interstitial brachytherapy with 125I seeds in the treatment of the prostate cancer.

Material and Methods: Methods and materials: from April 2004 until May 2014 we treated 306 patients with prostate cancer with permanent brachytherapy implants of radioactive 125I seeds with a prescription dose of 145 Gy. The technology is changed during the years and we identify 4 groups relative to each different image-guided method. Group 1: 107 implants from April 2004 until January 2007 using ultrasound guide in the transverse plane, fluoroscopic check and planning with 3D Prowess TPS; Group 2: 76 patients until October 2008 with Variseed 8.0 TPS and ultrasound both for transverse and longitudinal guide; Group 3: 43 patients until February 2010 with a "real-time" ultrasound guide both for transverse and longitudinal guide; Group 4: 80 patients with a new delivery system to assembly seed trains (Quicklink, BARD). For each group we calculate the mean D90 in the "postplanning" (evaluated on CT images after 60 days) and the difference between planning and postplanning in terms of D90 and V100 (dose fall-off). In the last group we evaluate also the difference, in terms of D90, V100 and maximum urethra dose between the theoretical planning and the effective implant, evaluated in the operating room on the ultrasound images at the end of the surgery.